

From: [Tsiamis, Christos](#)
To: [Carr, Brian](#)
Subject: Design tank volumes in NYCDEP's Preliminary Design
Date: Friday, January 15, 2016 11:00:20 AM

Brian,

As was the case with the cost estimates (see EPA's contractor's general comments in my e-mail to you on 12/21/2015), it appears that NYCDEP in its Preliminary Design has inflated the volume of excavation required to retain an 8 MG retention tank. In different drawings of the Design report, NYCDEP has depicted different volumes for the excavation needed to accommodate the 8 MG retention tank called for in the ROD. In the best case (presented in the Hydraulic Profile drawing) the volume of the tank is still 125% of the 8 MG. While some of that volume might be attributed to NYCDEP's design approach, which includes specific tank operation support facilities, the design volumes appear excessive and unwarranted. And, of course, that impacts costs and makes the site considerations for the placement of the tank more complicated.

See EPA's contractor's comments below.

Christos

CH2M reviewed the preliminary drawings in NYCDEP's *Preliminary Remedial Design Report. Red Hook Outfall RH-034 CSO Facility at Alternative Site RH-4, Gowanus Canal, Brooklyn, New York, November 2015* to determine the volumes of the tanks compared to 8 million gallon (MG) tank size in the Record of Decision (ROD). The drawings are located in Appendix A: Preliminary Drawings.

Based on Drawing Number RH4-001, *Plan @ Elev. -21.28' (-23.5') RH034 – Site RH4 8MG*, the overall footprint of the facility appears to be 200 feet wide by 350 feet long. The facility has various depths but overall appears to be 60 feet at its deepest point based on the surface elevation shown. The top of the storage tanks of the facility appears to be at the existing surface elevation of the site. The volume of a 200'x350'x60' excavation to accommodate that size facility is approximately 155,600 cubic yards or 31.4 MG.

The footprint of the tanks alone in the facility is 126 feet long by 258 wide (for all 6 tanks). The tanks are 52 feet deep, halfway along their lengths with a 1% slope. The overall volume of this dimension of 126'x258'x52' is approximately 62,600 cubic yards or 12.6 MG. This is much larger than the 8 MG in the ROD.

There is a hydraulic profile of the facility in Drawing Number RH4-D-002, *RH4 Hydraulic Profile*. The profile indicates that the maximum water surface elevation in the tank will be at elevation 2.12 feet (-0.1). The top of the structure has been drawn at the existing ground elevation of 14.22' (12.0') (APPROX). Giving an allowance for the thickness of the roof of the tanks, there appears to be at least 10 feet of freeboard between the maximum calculated surface water elevation and the roof of the tanks. If that 10 feet was deducted from the tank volume calculation, the tanks would still be approximately 10 MG.

There are tipping buckets, weirs and walls between the tanks that would expend some of that 10 MG. But more storage will be realized by the volume of CSO held in the conveyance from the diversion at RH-034 to the facility and in the influent channels and screening chamber to compensate for that.

The facility shown in NYCDEP's *Preliminary Remedial Design Report* appears to be designed to retain approximately 125% of the 8 MG in the ROD.